DEPARTMENT OF EDUCATION

LOWER SECONDARY SCHOOL CERTIFICATE EXAMINATIONS

MATHEMATICS

Monday

12th October 2015

Time allowed: 3 hours

Candidates are advised to fully utilise the time allocated

MA

INSTRUCTIONS TO CANDIDATES:

(***To be read out by the External Invigilator before the start of the examination***)

There are **46** questions in this paper worth **1 mark each**. Attempt ALL questions, even if you are not sure of some of the answers.

The Examination is divided into three parts:

PART A: Multiple Choice (Questions 1 to 25)

PART B: Short Answer (Questions 26 to 45)

PART C: Extended Response Questions 46

The Answer Sheet is part of the Examination Booklet. Take out the middle pages and remove the Answer Sheet by tearing along the perforation. You may use the blank sheet for rough work.

Write your candidate number, name and school name in the space given on the **Answer Sheet**.

For each question in **PART A** choose the best answer and write its LETTER in the space given on the Answer Sheet.

For each question in **PART B** and **PART C** work out the answer and write the answer in the spaces provided on the **Answer Sheet**.

If you find a question very difficult, do not spend too much time thinking about it. Leave the question out and go on with the rest of the paper. If you have time at the end, return to the difficult questions and think about them more carefully.

Write your answers in **BLUE** or **BLACK** ink (pen or biro).

If you decide to change an answer, make your correction as shown below so that it is clear to the markers what your final answer is. Do NOT use correction fluid on your answer sheet.

2	~~A~~	B

Hand in **BOTH** the Answer Sheet and the papers used for rough work at the end of the examination.

Extra time will not be allowed to complete the examination under any circumstances.

The penalty for cheating or assisting others to cheat in national examinations is non-certification.

DO NOT TURN OVER THE PAGE AND DO NOT WRITE UNTIL YOU ARE TOLD TO START.

PART A (Questions 1 to 25) : 1 mark each.

For each question choose the best answer by writing A, B, C or D in the space provided on the ANSWER SHEET.

QUESTION 1

Make **I** the subject in the formula **A = P + I**.

A. I = A + P B. I = P - A

C. I = A/P D. I = A - P

QUESTION 2

Find the missing term in the sequence.

-2, 6, -18, ____, -162, 496……

A. 24 B. 42

C. 54 D. 62

QUESTION 3

Simplify: $\frac{y^7 \times y^4}{y^5}$

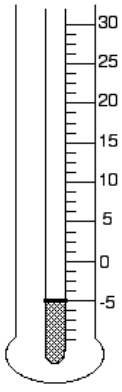
A. $y^{5.6}$ B. y^6

C. $y^{2.2}$ D. y^{23}

QUESTION 4

The temperature shown indicates the temperature of Mt. Wilhelm one morning.

What was the starting temperature if it had fallen by 20°C?



A. 30°C

B. 25°C

C. 20°C

D. 15°C

QUESTION 5

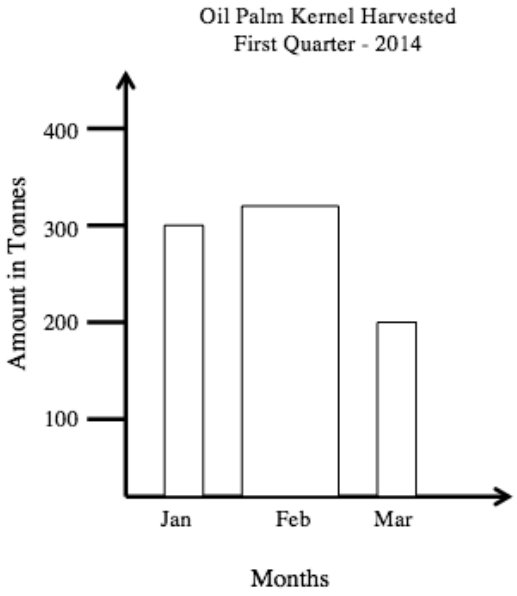
Rolland and Sammy shared K200 in the ratio $2:3$ respectively. How much did Sammy receive?

A. K80 B. K100

C. K120 D. K150

QUESTION 6

Which part of the graph shown is misleading?



A. The scale used on the vertical axis.

B. Uneven sizes of bars used on the horizontal axis.

C. The Title of the graph

D. Uneven sizes of bars and the vertical axis

QUESTION 7

Factorise: $a(b+1)-2(b+1)$

A. $-2a(b+1)$ B. $a-2(b+1)$

C. $(a-2)(b+1)$ D. $a-2(b+1)(b+1)$

QUESTION 8

A man leaves town A and travels West for 80km. He then turns and travels East for 100km.

How far and in what direction is he from town A?

A. 20 km East B. 20 km West

C. 30 km East D. 30 km West

QUESTION 9

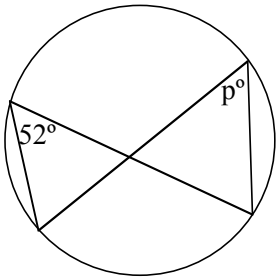
A TV screen was selling at a cost of K900 in April. In May the price reduced to K720.

What was the percentage decrease of the price?

A. 10% B. 20% C. 30% D. 40%

QUESTION 10

Calculate angle **P** in the figure shown.



A. 20° B. 38°

C. 52° D. 90°

QUESTION 11

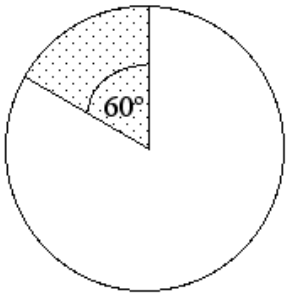
Simplify: $\left[\left(a^4b^5\right)^2 \div \left(a^9b^7\right)^0\right] \div ab^2$

A. b^{16} B. a^2b^7

C. a^6b^7 D. a^7b^8

QUESTION 12

The radius of a circle is 6 meters. What is the area of the sector bounded by a 60º arc?



A. 6π

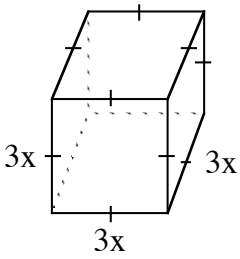
B. $\frac{\pi}{6}$

C. 60π

D. $\frac{\pi}{60}$

QUESTION 13

A cubic storage container as shown in the diagram has side lengths of $3x$ metres.



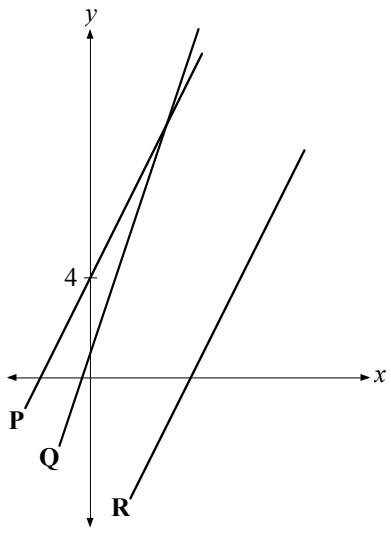
What is the simplified expression for the volume?

A. $27x^3$ B. $27x$

C. $9x^3$ D. $9x$

Question 14 and 15 refer the line graphs.

Line P and R are parallel and line P has a gradient of 2. The equation of line Q is $y = 3x + 1$.



QUESTION 14

What is the gradient of line R?

A. 1 B. 2

C. 3 D. 4

QUESTION 15

What is the co-ordinate of the point of intersection of lines P and Q?

A. (2,9) B. (2,10)

C. (3,9) D. (3,10)

QUESTION 16

$\left(8 \times 10^5\right) \div \left(4 \times 10^{-3}\right)$

A. 2×10^8 B. 2×10^7

C. 2×10^3 D. 2×10^2

QUESTION 17

Solve for x in: $1 - \frac{x+1}{2} = 0$

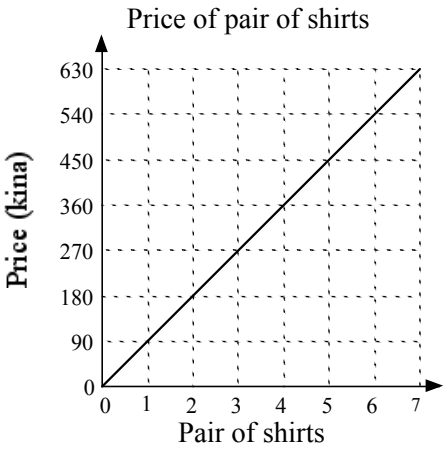
A. -3 B. 1

C. 2 D. 3

B. $\frac{3x+23}{3}$

Question 18 and 19 refers the line graph.

The graph shown indicates the price of *pairs of shirts* in a shop.



QUESTION 18

What is the cost of 6 shirts?

A. K270 B. K360

C. K450 D. K540

QUESTION 19

For 'Christmas Specials' the shop gave a 10% discount if over 5 pairs of shirts were bought.

How much would be paid for 7 pairs of shirts?

A. K415 B. K540

C. K567 D. K630

Question 20 and 21 refer to the information below.

The height of a group of primary school students measured correct to the nearest centimetre are as listed;

131, 116, 120, 126, 128, 117, 132,129, 128, 122, 133,

126, 122, 126, 130, 121, 125,123, 116, 117, 130, 130,

127, 119, 125

The data is recorded in a frequency table using class intervals:

115—119, 120—124, 125—129 and 130 —134.

QUESTION 20

Which is the modal class?

A. 115—119 B. 120—124

C. 125—129 D. 130—134

QUESTION 21

What fraction of students represented in decimal fraction are found in the 120—124 class interval?

A. 0.20 B. 0.24

C. 0.36 D. 0.45

QUESTION 22

In an experiment a six-sided die was tossed 90 times. The results of the tosses are as recorded in the table below.

Face Number	Result of Tosses (Number of times appearing)
1	13
2	15
3	14
4	12
5	18
6	18

Which Face Number had an experimental probability that matched its expected probability?

A. 2 B. 3

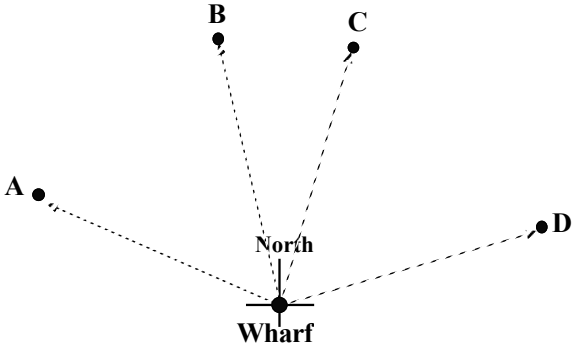
C. 4 D. 5

Question 23 and 24 refer to the following information

From a wharf a fishing boat sails 8km northwest, then steers 15km northeast before it stops so fishing nets can be set into the sea.

QUESTION 23

Which position most likely represents where the boat stops for nets to be set?



QUESTION 24

How far in kilometres is the stop position from the wharf in a straight line?

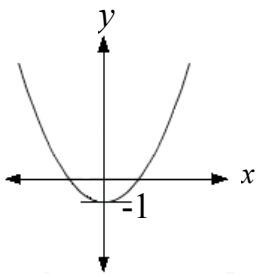
A. 7 B. 15

C. 17 D. 20

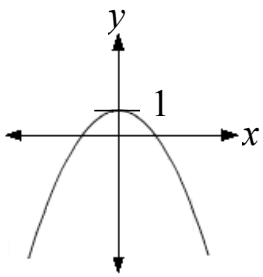
QUESTION 25

Which illustration best describes the graph of $y = 1 - x^2$?

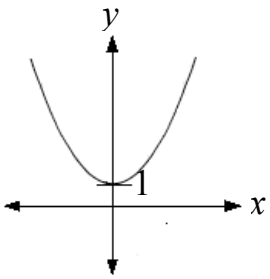
A.



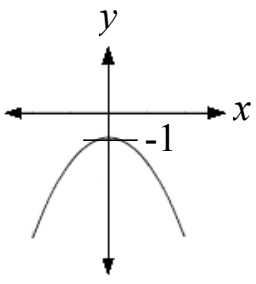
B.



C.



D.



PART B: (Questions 26 to 45): 1 mark each.

Work out your answer and write it in the spaces provided on the ANSWER SHEET

QUESTION 26

Convert 1.4 hours to minutes.

QUESTION 27

On a map 5cm equals an actual distance of 75km. If a certain village is 180km from a town, what would be the map measurement in centimetres?

QUESTION 28

Owen borrowed K2,500 to be paid back at Simple Interest. Over a period of 2 years he repaid K3,000.

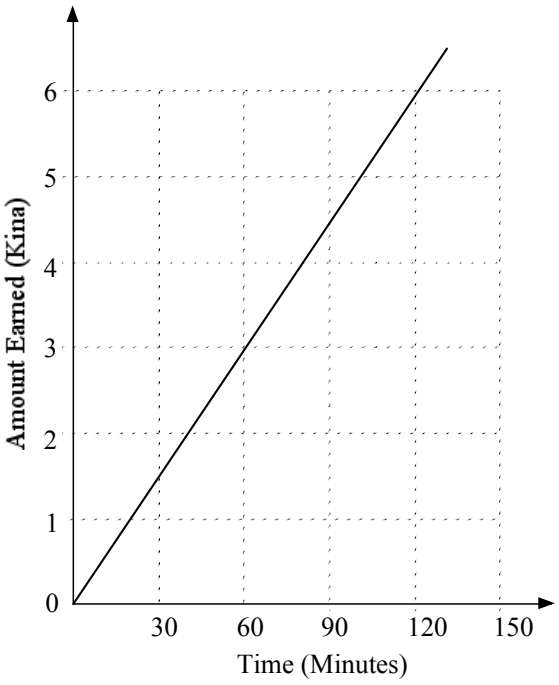
What was the interest rate?

QUESTION 29

In a certain school 80% of the students are boarding students and 250 are day students. How many students are there altogether?

Question 30 and 31 refer to the following.

The graph shows the rate at which a casual worker is paid.



QUESTION 30

How many minutes would the worker have to work to earn K4.50?

QUESTION 31

In a certain week the worker works a total of 35 hours. How much in Kina would he earn in that week?

QUESTION 32

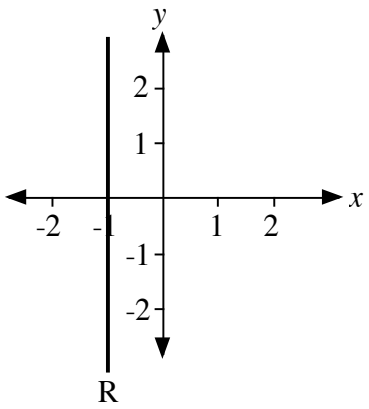
Find the value of r in $V = \frac{1}{3}\pi r^2 h$, given $V = 66$, $\pi = \frac{22}{7}$ and $h = 7$.

QUESTION 33

A shop doing a clearance sale offered a 10% discount on all stock. The price of a certain bicycle dropped by K45. How much was its original price in kina?

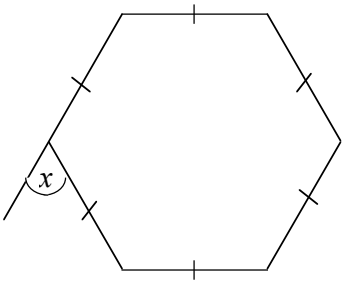
QUESTION 34

What is the equation of line **R**?



QUESTION 35

What is the value of ***x*** in the diagram?



QUESTION 36

Solve for m in $\frac{2m+1}{3} - 2m = 1$

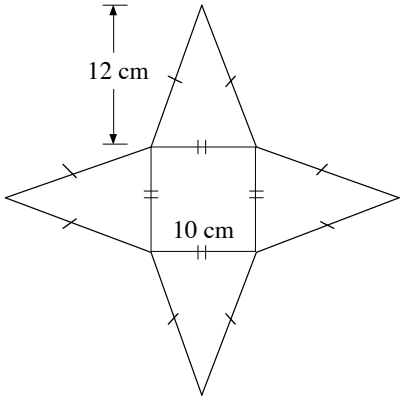
QUESTION 37

Paul had K350 to share amongst his 3 children. He gave 40% to Simon, 35% to Mary and 25% to Andrew. Simon gave a quarter of his share to his friend.

How much will Simon have left?

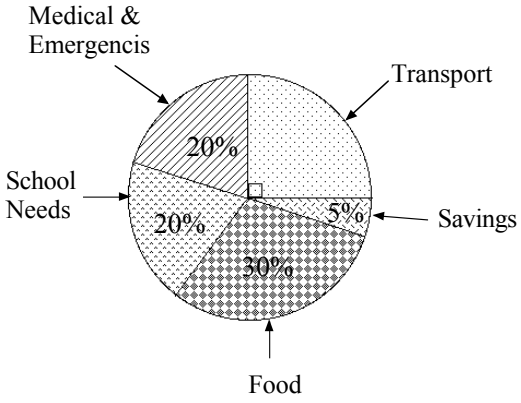
QUESTION 38

Calculate the surface area in square centimetres of the solid formed by the net shown.



For Questions 39 and 40, refer to the graph below.

The graph shown represents Jenny's fortnightly budget. Every fortnight she puts K40 aside as her savings.



QUESTION 39

How much is her net income per fortnight?

QUESTION 40

One fortnight her budget was disrupted and she had to use half of her savings to help pay medical fees for her very sick child.

How much did she spend altogether on medical fees?

For Questions 41 and 42, refer to the information below.

Ranu is paid K4.00 per hour. Her normal working week is 35 hours and she receives *time and a half* for additional hours worked.

QUESTION 41

Calculate her wage if she worked for 37 hours.

QUESTION 42

In a certain week Ranu is paid K176. How many hours was she paid at *time and a half*?

For Questions 42 and 43, refer to the information below.

A fisherman cast his net from a boat 10 meters out from the base of a 10-meter high cliff.

QUESTION 42

What will be the angle of elevation from the boat to the cliff top?

QUESTION 43

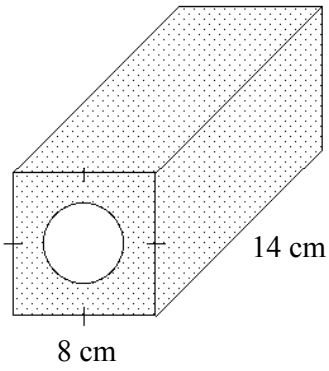
The boat then drifts further out resulting in an angle of depression of 30º from cliff top to the boat. At that moment, how far out is the boat from the base of the cliff in metres? (Use the appropriate trig ratio in the table in your calculation.)

angle	*sine*	*cosine*	*tangent*
60º	0.8660	0.5000	1.7320
30º	0.5000	0.8660	0.5774

QUESTION 45

A square prism has a uniform circular hollow of diametre 4 cm.

Calculate the volume of the solid in cubic centimetres.
(Use $\pi = \frac{22}{7}$)



PART C: Extended Response Question 5 marks

QUESTION 46

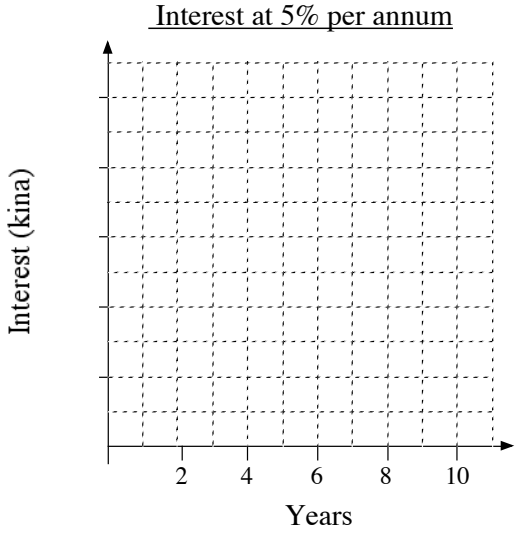
Refer to the information below and write your answers in the spaces provided on the ANSWER SHEET.

Roselyn and Daniel each had K10,000 and decided to invest their money. Roselyn invested her money for 2 years at a rate of 5% per annum simple interest. David invested his money for 2 years at 5% per annum interest compounded annually.

(a) What was the simple interest earned on Roselyn's investment? (1 mark)

(b) What was the interest earned on David's investment? (1 mark)

(c) Complete the Simple Interest Graph by filling the units on the vertical axis and drawing a line graph showing the amount of interest Roselyn will earn if she decides to invest over a period of 10 years. (2 marks)



(d) What was the value of David's investment after 1 year? (1 mark)

END OF EXAMINATION

LOWER SECONDARY SCHOOL CERTIFICATE EXAMINATION – 2015

MATHEMATICS – ANSWER SHEET

MARKER 1

YEAR		PROV.		SCHOOL			CANDIDATE NO.		
1	5								

NAME	
SCHOOL	

MARKER 2

PART A: **(QUESTIONS 1 to 25)** Write the letter of your answer next to each question number below.

1		**6**		**11**		**16**		**21**	
2		**7**		**12**		**17**		**22**	
3		**8**		**13**		**18**		**23**	
4		**9**		**14**		**19**		**24**	
5		**10**		**15**		**20**		**25**	

PART B: **(QUESTIONS 26 to 45)** Write your answer next to each question number.

26	min	**31**	K	**36**		**41**	K
27	cm	**32**		**37**	K	**42**	hrs
28	%	**33**	K	**38**		**43**	o
29		**34**		**39**	K	**44**	m
30	min	**35**		**40**	K	**45**	cm^3

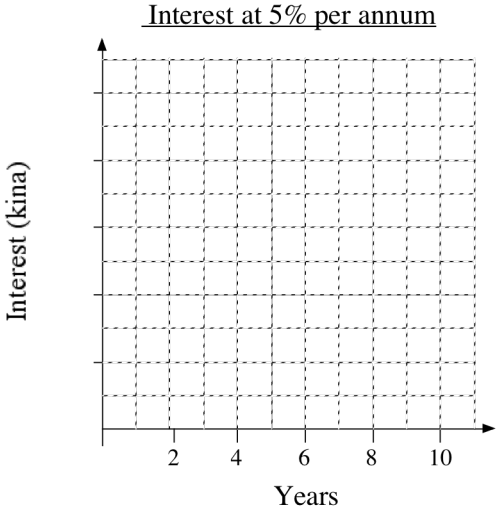
PART C: **(QUESTIONS 46 - 50)**

Write your answer next to each question number below.

a)	K
b)	K

d)	

c)



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YOU MAY DO YOUR ROUGH WORK ON THIS PAGE

CAREFULLY TEAR ALONG THIS PERFORATION

YOU MAY DO YOUR ROUGH WORK ON THIS PAGE